POLICY RESEARCH WORKING PAPER 2207

Jamaica's Food Stamp Program

Impacts on Poverty and Welfare

Kene Ezemenari
Kalanidhi Subbarao

Without the food stamp program, the poverty gap in Jamaica would have been much worse during the early 1990s, when the Jamaican dollar was being devalued. Households with elderly members and young children benefited most from the program.

The World Bank
Poverty Reduction and Economic Management Network
Poverty Division
October 1999

Summary findings

Ezemenari and Subbarao examine how the food stamp program affected measures of poverty during devaluation of the Jamaican dollar in the early 1990s.

They find that without the food stamp program, the poverty gap in Jamaica would have been much worse, especially in 1990 and 1991.

For the country as a whole, not having a food stamp program wouldn't have affected the incidence of poverty significantly, but particular groups among the poor would have fared worse.

Households with elderly residents benefited most from the program. Households with young children benefited more than households without, in terms of the poverty headcount and gap.

The program also appears to have had more effect on extremely poor households than on those of the transient poor (people who move in and out of poverty).

Explicitly incorporating behavioral responses into the model reduces the contribution of food stamps to household consumption and poverty, but the poorest benefited most from the program even after accounting for behavioral responses. The program contributed more to reducing poverty than to smoothing consumption.

This paper — a product of the Poverty Division, Poverty Reduction and Economic Management Network — was presented at the World Bank Institute workshop "Evaluating the Impact of Development Interventions: Concepts, Methods and Cases," December 9–10, 1998. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Gloria Peralta, room MC3-787, telephone 202-473-7405, fax 202-522-3283, Internet address gperalta@worldbank.org. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/html/dec/Publications/Workpapers/home.html. The authors may be contacted at kezemenari@worldbank.org or ksubbarao@worldbank.org. October 1999. (36 pages)

Jamaica's Food Stamp Program: Impacts on Poverty and Welfare[1]

Kene Ezemenari and K. Subbarao

Poverty Group, PREM Network
The World Bank

[1] This paper was presented at the EDI Workshop, "Evaluating the Impact of Development Interventions: Concepts, Methods and Cases", (December 9-10, 1998). For discussions and comments on an earlier draft of this paper, the authors would like to thank Harold Alderman, Paul Glewwe, Margaret Grosh and Dominique van de Walle.

Jamaica's Food Stamp Program: Impacts on Poverty and Welfare

1 Introduction

Over the last two decades, the proliferation of macro-economic adjustment and stabilization programs has given rise to a concern with the associated social costs, and an interest in the role of safety nets for the poor during the process of economic reform. However, few countries have been able to introduce safety nets *during* economic reform; and among these countries, few have had available the datasets to facilitate an *evaluation* of the role of the safety net in cushioning adverse short-run outcomes of adjustment on the poor. Jamaica is one of the countries which does have available nationally representative datasets (some in *panel* form) that cover such programs as the Poor Relief and Public Assistance, the School Feeding Program and the Food Stamp Program —all operating alongside the economic reform program. This paper will focus on the most important of them all: the Food Stamp Program (FSP).

There have been few impact evaluations of the Jamaican FSP. Studies to date have focused on access and targeting efficiency, but only rarely on the consumption effects or poverty impacts. For example, Grosh (1992) gives an overview of the FSP in terms of administration and operations, participation and targeting efficiency. Grosh (1992) finds that the FSP was better targeted than the previous general food subsidy program: 57 percent of FSP benefits accrued to the poorest 40 percent of the population in 1988, while 6 percent of FSP transfers accrued to the wealthiest quintile. This contrasts with the food subsidy program which resulted in 34 percent of the food price subsidy accruing to the

poorest 40 percent of population. The use of public health centers as distribution centers for food stamps was found to be central for FSP's better targeting outcomes.

However, despite these targeting outcomes, it is not clear how effective the level of the benefit has been in reducing poverty. The existence of comprehensive panel datasets on the living conditions of Jamaican households during a period of economic reform and FSP experiment, provides an opportunity for an evaluation of the poverty impact of the FSP. This study is an attempt in this direction.

The paper begins with a brief overview of the economic trends leading up to the devaluation of the Jamaican dollar in the early 1990s, followed by a description of the Jamaican food stamp program. The next section outlines the methodology; and final sections present some empirical results and conclusion.

2 The Policy Context

Jamaica's policy reform efforts span over fifteen years and has yielded mixed results. The oil shocks of the early 1970s coupled with the decline in prices of bauxite—the major export crop—resulted in a decline in real GDP and labor income between 1973 and 1980. In order to minimize the adverse consequences of a decline in income, the government increased public expenditures on social services, expanded employment in the public sector, increased the money supply and real wages. As a result, government expenditure as a percent of GDP increased from 25 percent in 1972 to 46 percent in 1976 and the fiscal deficit increased from 5 percent to 24 percent of GDP. By 1977, the government allowed real wages to decline and turned to subsidies to mitigate the adverse effects of reform. The share of subsidies in national disposable income increased from 2

percent to 6 percent between 1976 and 1977. By 1980, the fiscal deficit as a percent of GDP was 18 percent.

In 1981, the government concluded a stand-by agreement with the IMF. The objective was to reduce the role of the public sector and promote private sector economic activity with an export-oriented focus. The agreement provided for a large devaluation and restrictions on government expenditure. In 1984 the government implemented strict fiscal austerity programs and cut public employment, labor costs, and social services. Minimum wages fell by 11.8 percent from September 1983 to July 1985.

Further progress was made during the late 1980s in trade liberalization and public sector restructuring. Fifty of the 330 public entities were phased out, thus reducing public sector employment. Price controls and subsidies were removed, and minimum farm-gate prices for key export crops were introduced. Interest subsidies in the agricultural sector were abolished. Generalized food subsidies were replaced by a targeted food assistance to the poor. Although the gradual opening up of the economy had some impact on growth (during the period 1986-90 the economy grew at 5 percent per year), fiscal and monetary policies continued to be expansive, fueling inflation. The exchange rate was fully liberalized in October 1991, which was followed by a substantial devaluation of the Jamaican dollar. During 1989-92, the incidence of poverty increased (Table 1).

Table 1: Incidence of Poverty and Food Stamps in Jamaica

	November 1989[a]	*November 1990*	*November 1991*	*November 1992*
Percent Poor	26.9	27.9	38.9	34.2
Poverty Gap	8.8	7.9	13.7	10.6
Poverty Severity	3.9	2.9	6.6	4.4
Percent Households Receiving Food Stamps				
Poorest Quintile	33.7	29.3	42.6	45.0
2	26	20.4	27.6	36.6
3	17	14.2	20.3	27.1
4	8.7	9.2	11.7	16.3
Top Quintile	4.0	2.7	4.0	6.1
Jamaica	14.9	12.8	17.8	20.0

[a] Quintile data for 1989 refers to the month of July of the Jamaican Survey of Living Conditions.
Source: Jamaica: A Strategy for Growth and Poverty Reduction Country Economic Memorandum, 1994, World Bank; and Jamaica Survey of Living Conditions Report 1992, The Planning Institute of Jamaica and The Statistical Institute of Jamaica.

3 The Jamaican Food Stamp Program (FSP)[2]

In order to mitigate the adverse short-run impacts of macro-economic stabilization measures on the poor, the Government of Jamaica (GOJ) implemented the FSP in 1984[3]. The food stamp program was targeted to two main categories of people who were considered at nutritional risk: (i) pregnant and lactating women and children under 5 years of age; and (ii) the poor, elderly and handicapped. The continuing devaluation of the Jamaican dollar coupled with inflation prompted GOJ to expand the eligibility category in September 1990, to include poor single member households with incomes below J$3,000 per annum and families with two or more members with an income below J$7,200.

[2] This section is based on Grosh (1992) which provides a detailed description of the operation of the program. See also Andersen (1993).

[3] In addition, a school feeding program was also introduced.

Institutional Structure of the FSP. The FSP is administered through various government ministries. The Ministry of Labor, Welfare and Sport is responsible for overall administration, means testing, registration of participants, distribution of stamps, etc. The Ministry of Health facilitates the registration and distribution of stamps to pregnant/lactating women and children under 5. The Ministry of Local Government, through its Poor Relief Officers, facilitate the enrollment of beneficiaries. The Ministry of Finance and the Planning Institute coordinate the role of the program in overall government budgeting. Finally, the Jamaican Commodity Trading Company monetizes the food donations which partially support the program.

Commodity Coverage. Food stamps are good towards the purchase of cornmeal, rice and powdered skimmed milk. However, stamps are actually traded for a wider range of goods, although generally most of these are staple goods. Food stamps are legal tender and are accepted at commercial grocery outlets. Retailers use collected stamps as part of their payments to their wholesalers. The stamps can be used by retailers to purchase any commodity from wholesalers (including those not covered by the program). This greatly simplifies the reclamation system and increases the willingness of the distribution chain to participate. Wholesalers redeem the stamps at their banks. The Central Bank then turns the stamps over to the Ministry of Labor, Welfare and Sport where they are used to reconcile records, are stored for six months and then burned.

Eligibility and Access. Children under 5, pregnant, and lactating women are automatically eligible. Members of each group register at clinics. Pregnant women are kept on the rolls until their expected delivery dates, at which time they must re-register as

lactating mothers. No proof of lactation is necessary. Women are eligible for food stamps six months after the birth of a child.

All Poor Relief and Public Assistance recipients, as well as indigent households with income less than J$2,600 are automatically eligible for food stamps. A simple means test is used to determine eligibility. Poor Relief Officers and community members may name candidates for food stamps in the elderly, handicapped, and indigent category. Once a nomination has been made, the Poor Relief Officer makes a home visit to confirm eligibility. Based on the Officer's observation of the home, a recommendation is made either for or against the candidate, (the Officer cannot stop the application on his own authority).

Food stamp recipients pick up their food stamps in person on a pre-specified day, once every two months. Proxy forms, which are filled out in Poor Relief offices in advance, give the right to a proxy to pick up the stamps either on a specified date or on a continuing basis. Pregnant and lactating women, and mothers of children under 5 pick up their stamps at clinics at which they are registered. The elderly, handicapped or indigent category of beneficiaries pick up their stamps at the Poor Relief office or some pre-specified civic site –i.e. post office, town hall, police station. However, problems with crowd control and aggression at some distribution sites may have increased the cost of access to this latter group of beneficiaries.

Table 2: Coverage of the Food Stamp Program by Eligibility Category (Percent)

Category	*1989*	*1990*	*1991*	*1992*
Households with children <5 years	20	16.6	26.2	27.3
Households with pregnant and lactating mothers	n.a.	0.5	7.2	2.5
Households with elderly	18.6	22.3	30.1	42.7

Source: Jamaica Survey of Living Conditions Report, various years —November 1989, 1990, 1991, 1992. Planning Institute of Jamaica.

Table 3: Percentage of Households in Poorest and Richest Quintiles Receiving Food Stamp Transfers by Eligibility Category

Category	*1989*		*1990*		*1991*	
	Poorest Quintile	*Richest Quintile*	*Poorest Quintile*	*Richest Quintile*	*Poorest Quintile*	*Richest Quintile*
Households with children <5 years	34.6	5.3				
Households with elderly	38.5	5.5				
All Households	31.2	2.2	12.9	1.4	38.3	2.2

Source: Jamaica Survey of Living Conditions, November 1989, 1990, 1991.

In 1993, total costs of the program amounted to roughly 0.11 percent of GDP. During the period 1989-1992, the program reached between 12 and 20 percent of all Jamaican households (Table 1). During these same years, 30 to 40 percent of households in the poorest quintiles gained access to food stamps compared with 3 to 6 percent of households in the highest quintiles. These numbers illustrate the fact that the FSP has excellent targeting outcomes (compared to similar programs in other countries). With regard to access based on gender, Louat, Grosh and Van der Gaag (1993) found no

difference in access between male and female children in male- versus female-headed households.

Tables 2 and 3 summarize program access by eligibility criteria for select years. Coverage and participation is consistently highest for households with preschoolers and the elderly. We now turn to the main question we wish to address in this paper: what impact the program had (if any) on the (incidence of poverty and the poverty gap for the various categories of households.

3 Methodology

In order to determine the impact of FSP transfers on household welfare, the pre-FSP level of consumption is first estimated. Thereafter, stochastic dominance tests between the pre-FSP and post-FSP distributions of expenditure are computed to examine whether or not the FSP was effective in reducing poverty headcount and gap. Marginal stochastic dominance tests are then used to determine in which years the FSP was most effective in reducing poverty (for various groups). The specific methods are outlined below.

Estimation of pre-transfer consumption. Household expenditures are used as the measure of welfare. In order to estimate the counterfactual (i.e., household expenditures in the absence of FSP) the marginal propensity to consume (MPC) out of food stamp transfers is employed to generate pre- and post-reform distributions. The following equation is used to estimate the marginal propensity to consume:

$$C = a + b\,FSP + c\,(\text{household characteristics}) + \text{error term} \quad (1)$$

The coefficient on FSP is the MPC out of food stamp expenditure (which is assumed to be the same for all households). One issue in estimating the equation is the fact that food stamp transfers are correlated with a variety of household characteristics. In order to arrive at unbiased estimates of the MPC, it is necessary to account for these household characteristics in the regression. We deal with this problem by including as regressors, those characteristics of the household which are also criteria for receipt of FSP transfers. In addition, we exploit the availability of panel data by estimating a model of consumption in which household fixed effects (or any other potential household characteristics which may impact on the level of the FSP transfer and household consumption, but which does not vary over time) are eliminated by first differencing. Using the coefficient on FSP, the data on household expenditure (which represents post-FSP expenditure) are adjusted to derive the expenditure in the absence of the FSP transfer (i.e., the counterfactual situation). After generating the pre- and post-transfer distributions and ordering both according to the pre-transfer levels of expenditure, stochastic dominance tests are performed.

Stochastic Dominance Analysis. The concept of stochastic dominance is used to examine the effect of food stamps on poverty during the process of policy reform.[4] Consider the following distribution where P(z) is the probability distribution of household incomes defined as follows:

$$P_\alpha = \int_0^z [1 - (x / z)]^\alpha \qquad f(x)\, dx \qquad (2)$$

[4] For detailed analysis of the application of stochastic dominance for poverty, see Ravallion (1992).

where z denotes the poverty line

x is household income

f(x) is the probability of observing a household with income x

and α is a parameter.

The parameter α is a measure of the policy maker's sensitivity to inequality among the poor (Ravallion 1992). Varying the value of this parameter gives rise to various measures of the incidence of poverty. For example, $P_0 = H(z)$ is the poverty headcount index, and $P_1 = G(z)$ is the poverty gap index. Let H_F be the headcount index when the value of food stamps are included in household income, and H_{NF} be the headcount index when food stamps are not included in household income. Each household income, x is a realization from a random variable X. Define two cumulative distribution functions, $F(x)=Pr(X = x) = H_{NF}(z)$ and $W(x)=Pr(X = x) = H_F(z)$ for the random variable X. Then by Theorem 1 of Forster-Greer-Thorbecke (1984), the headcount index with food stamps, will be less than that without food stamps, (i.e., $H_F(z) = H_{NF}(z)$) for all z if and only if, $F(x) = W(x)$ for all x with at least one inequality. This is first order dominance (FOD).

Similarly, for the poverty gap, Foster and Shorrocks (1988) show that there is a correspondence between the orderings obtained from second order dominance (SOD) and the poverty gap $G(z) = P_1$.

Define $F_1(x) = \int_0^z F(t)\,dt$ and $W_1(x) = \int_0^z W(t)\,dt$, then $G_F(z) = G_{NF}(z)$ for all z if and only if $F_1(x) = W_1(x)$ with at least one strict inequality. In other words, if F_1 second order

dominates W_1, then the poverty gap in F cannot exceed that of W regardless of the poverty line chosen.

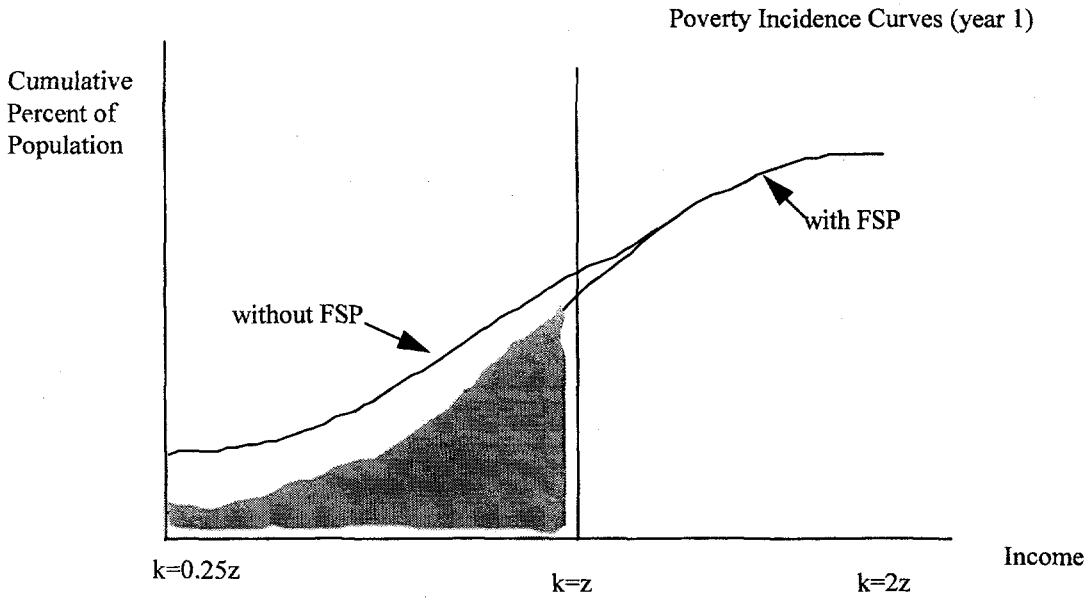
Figure 1 illustrates the concepts of FOD and SOD. In Figure 1, the poverty incidence curve with the food stamp program (FSP) dominates the poverty incidence curve without the FSP at all income levels close to and below the poverty line z: for any point estimate around the poverty line z=k, the area under the poverty incidence curve without the FSP is greater than the area under the incidence curve with the FSP. In other words, the cumulative proportion of the population with incomes below the poverty line is greater without FSP transfers. Thus, SOD follows. Explicit testing for SOD would be required if the poverty incidence curves crossed giving rise to ambiguity in ranking the distributions. In this instance, a comparison of the areas underneath the poverty incidence curves (the poverty gap curves) would be necessary.

Marginal Stochastic Dominance Analysis. To test the marginal contribution of food stamps to poverty reduction, the matched pair test procedure outlined in Bishop, Chow, and Formby (1994) and Bishop, Formby, and Zeager (1996) is used. Define D(k) (the value of the food stamp transfer) such that D(k) = F(k) - W(k), where k (=0, 0.25, 0.5 etc.) is some fraction of the poverty line—i.e. the value of food stamp transfers for households placed around the poverty line i.e. either lower, at, or higher than the poverty line set at 1. First-order marginal poverty dominance (FOMD) is defined as $D_{t+1}(k) = D_t(k)$, with at least one strict inequality prevailing where t refers to either a particular time period (i.e., year, month), or different groups (i.e., households with the elderly versus households with preschoolers).

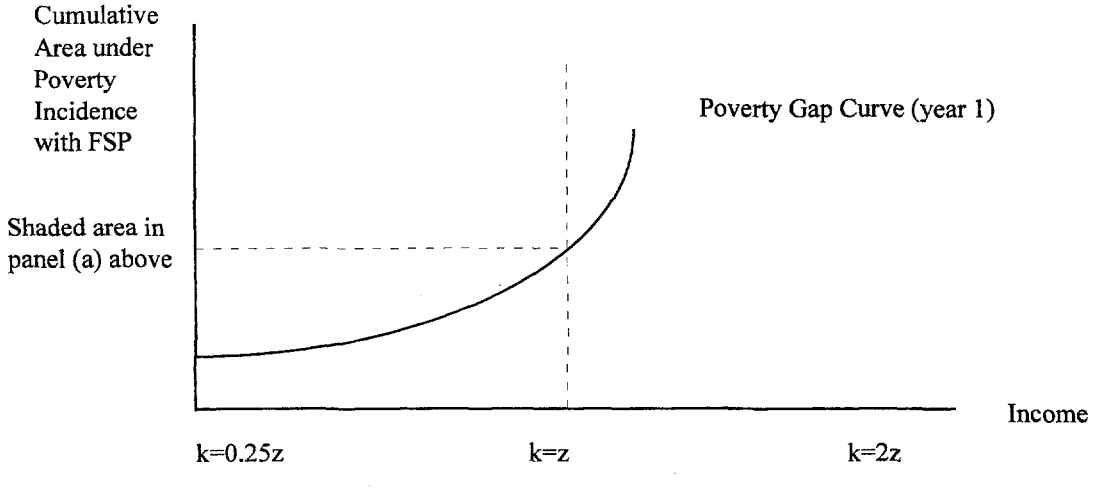
The marginal contribution of food stamps to poverty reduction can be evaluated by estimating the difference in the areas of the poverty incidence curves with and without food stamps. This is illustrated in Figure 2. In this instance, the concept of first order marginal dominance (FOMD) captures the marginal contribution of food stamps to poverty reduction. This is represented by the shaded area.

To determine how effective the FSP has been in reducing poverty for certain groups (transient poor versus structurally poor; households with preschoolers versus those with the elderly), the sample of households are divided up according to these categories and stochastic and marginal stochastic dominance tests performed for each sub-sample. This also answers the question of whether the FSP reduces poverty better in some categories of households (and for some years) than others.

Figure 1: Stochastic Dominance and Food Stamp Program



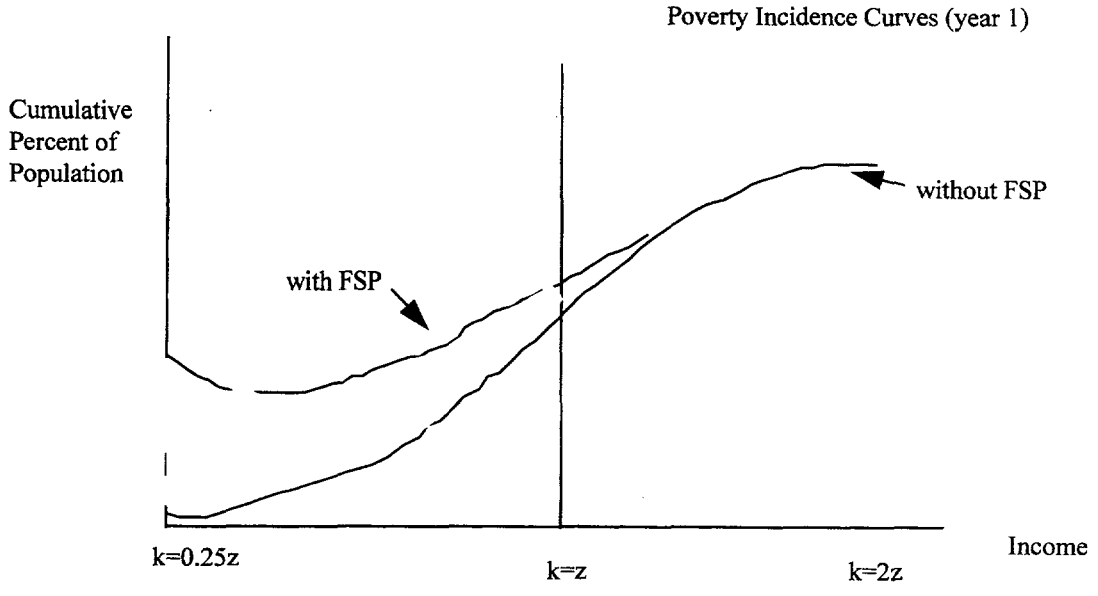
(a) Poverty Incidence Curves, with and without FSP transfers --FOD



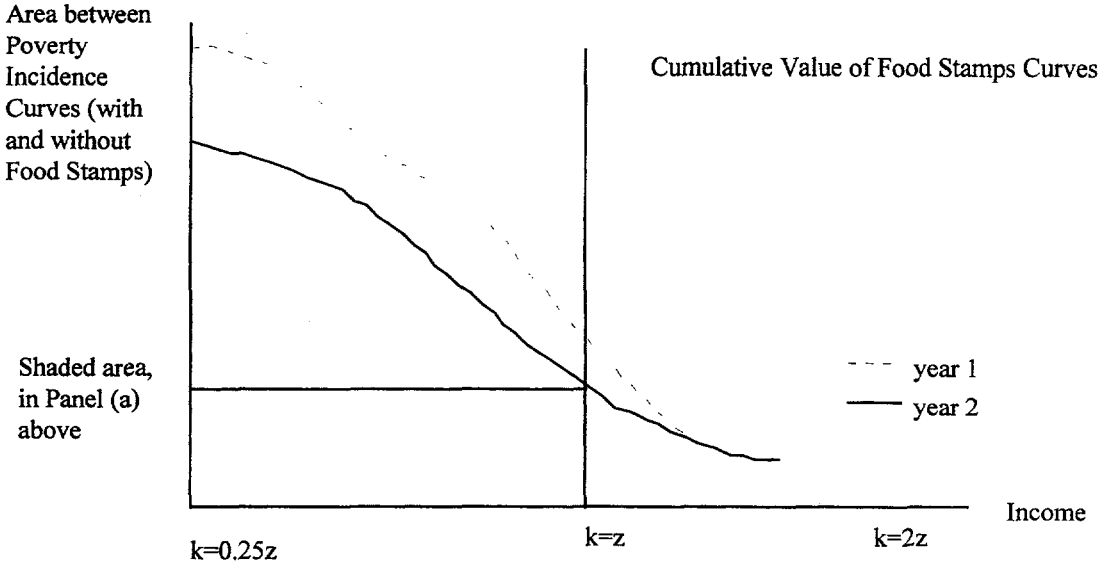
(b) Poverty Gap Curve with FSP transfer--SOD

Source: Adapted from Ravallion (1992).

Figure 2: Marginal Stochastic Dominance and Food Stamp Program



(a) Value of FSP transfers at each income level --FOMD



(b) Cumulative Value of FSP transfers at each income level--SOMD

4 Description of Data

The data used for this study come from the Jamaican Survey of Living Conditions (JSLC) for the years 1989 (November) to 1991. The modules consist of health, education, nutritional status, housing, distance to social services, and participation in government social programs. Grosh (1991) provides a detailed description of the JSLC. The period 1989-1991 was chosen because there was a gradual devaluation of the Jamaican dollar during this period ending in the major devaluation of 1991. In addition, during this period, there was an increase in the inflation rate and an increase in poverty indicators (see Table 1).

In estimating FOMD and SOMD, the full sample of households in 1989, 1990, and 1991 were used along with a sub-sample of households that formed a panel across these years. In order to construct the panel, dwellings were first linked using the procedure outlined in the document "Jamaica Survey of Living Conditions 1989-93: Basic Information" (page 39). However, the survey design was such that following the same dwelling over time was not synonymous with following the same household over time. In order to ensure that this was the case, it was necessary to list the household roster (for the age, sex and individual identification variables) and perform a manual check of individuals to ensure consistency. This led to the elimination of some households. The final panel consisted of 986 households. Summary statistics for expenditure and food stamp transfers are listed in Table 4.

Table 4: Summary of Expenditures and Food stamp transfers, 1989-91

Variable (Averages and Standard Deviations)	*1989*		*1990*		*1991*	
	Panel Sample	*Full Sample*	*Panel Sample*	*Full Sample*	*Panel Sample*	*Full Sample*
Real per capita food stamp transfer	61.01	53.05	20.87	20.38	80.46	73.68
Standard Deviation	169.14	182.08	94.94	105.59	275.61	287.62
Real per capita expenditure	13121.11	15657.41	11480.82	13255.80	10986.79	13560.53
Standard Deviation	14346.13	17169.30	12248.52	14712.78	10683.61	20071.55
Average household size	4.39	4.07	4.26	3.97	4.21	3.93
Standard Deviation	2.81	2.83	2.72	2.68	2.74	2.66
Number of Observations	986	3836	986	1821	986	1804

Note: Estimates are weighted to represent the sample population. All values in 1991 dollars.

5. Post-transfer estimates of poverty

Table 4 presents the level of expenditure and food stamp transfers for the whole sample and the panel sample. Average per capita expenditures are consistently lower for the panel dataset compared to the full sample across all years. In addition, average household size is slightly lower for the panel and food stamp transfers slightly larger for the panel. This suggests that the panel sample contains a slightly higher proportion of the poor than does the full sample. This is supported by a comparison of poverty measures[5] between the panel and full sample across all years for the poor (Table 5), and for the ultrapoor (Table 6).

[5] The poverty lines chosen were respectively the third decile (with mean per capita expenditure of J$6198 in 1991 dollars); and for the ultra-poor, the first quintile (with mean per capita expenditure of J$3657 in 1991 dollars). These figures contrast with the poverty line employed in Louat, Grosh, and van der Gaag (1993) and estimated in Gordon (1989) of roughly J$3000 in 1989 (or J$5,527 in 1991 dollars). Andersen (1993) estimates an updated poverty line of J$6544.10 in 1991.

Table 5: Comparison of Poverty Measures (between Full Sample and Panel Sample)

Poverty Measure (as percent of all individuals)	*1989*		*1990*		*1991*	
	Panel Sample	*Full Sample*	*Panel Sample*	*Full Sample*	*Panel Sample*	*Full Sample*
Headcount	29.3	24	34.2	29	34.6	29
Poverty Gap	10.1	7.9	10.7	9.3	12.2	9.9
Mean Food Expenditure Share	40.1	38.9	48.3	46.8	44.7	43.4
Mean Expenditure	13579	16610	12038	14240	11233	14388
Number of Households	986	3813	986	1821	986	1864

Note: The poverty line used is the third decile of 1989 per capita expenditure (which is equivalent to J$6198 in 1991 dollars). Estimates are weighted to represent the population.

Table 6: Comparison of Poverty Measures for the Ultra-Poor (Full and Panel Sample)

Poverty Measures (as a percent of all poor)	*1989*		*1990*		*1991*	
	Panel Sample	*Full Sample*	*Panel Sample*	*Full Sample*	*Panel Sample*	*Full Sample*
Headcount	38.9	36	32.4	32	39.6	36
Poverty Gap	10.3	9.6	8.3	7.9	11.2	9.9
Mean Food Expenditure Share	46.7	47.7	54.4	54.4	51.1	50.7
Mean Per Capita Expenditure	4062	4115	4264	4233	4024	4094
Number of Households	305	954	353	573	356	552

Note: The ultra-poverty line used is the first quintile of 1989 per capita expenditure (which is equivalent to J$3657 in 1991 dollars). Estimates are weighted to represent the population.

Table 7 summarizes the dynamic aspects of poverty. The panel sample is divided into three groups[6]: those households that moved into and out of poverty (transient poor), those that remained in poverty throughout 1989-1991 (structural poor), and a sample of all poor households (structural and transient poor). The poverty lines of J$3657 and J$6198 are used to determine respectively the estimates of poverty over the three years in

[6] The potential effect of measuring error was examined by first categorizing households according to a relative poverty line based on predicted consumption outcomes. Categorization of households into poverty categories based on predicted consumption yielded similar results to that based on actual consumption.

the poor and ultrapoor categories. As would be expected, extreme poverty is concentrated among those households that remain poor across all three years.

Table 7: Dynamic Aspects of Poverty

	1989		*1990*		*1991*	
Transient Poor						
--poor in some but not all years						
(N=356;	***Ultra***	***Poor***	***Ultra***	***Poor***	***Ultra***	***Poor***
mean per k expenditure=7627)	***Poor***		***Poor***		***Poor***	
Headcount	7.8	38.3	11	53.8	13.9	52.2
Poverty Gap	1.5	9.6	2.4	13.4	3.7	15
Mean Food Expenditure Share	47.6	43.1	56.2	52.2	51.7	47.8

	1989		*1990*		*1991*	
Structural Poor						
--poor in all three years						
(N=164;	***Ultra***	***Poor***	***Ultra***	***Poor***	***Ultra***	***Poor***
mean per k expenditure=3628)	***Poor***		***Poor***		***Poor***	
Headcount	55	99.4	47	100	55	100
Poverty Gap	16	42.7	13	38.7	16	43
Mean Food Expenditure Share	47.3	48.6	56.4	56.8	53.2	53.1

	1989		*1990*		*1991*	
Structural and Transient Poor						
--poor in any year						
(N=520;	***Ultra***	***Poor***	***Ultra***	***Poor***	***Ultra***	***Poor***
mean per k expenditure=6394)	***Poor***		***Poor***		***Poor***	
Headcount	22.3	57	22	68	26.8	67
Poverty Gap	5.9	19.8	5.7	21	7.4	24
Mean Food Expenditure Share	47.5	44.8	53.5	56.3	49.4	51.9

Note: The ultra-poverty line used is the first quintile of 1989 precept expenditure. Estimates are weighted to represent the population and show the percent of the poor who fall below the ultra-poverty line of J$3657 in 1991 dollars.

6 Estimation of Pre-transfer expenditures

In order to determine the pre-transfer level of expenditure, it is necessary to determine by how much household expenditures would decline if food stamp income were eliminated for those households currently receiving these transfers. This involved specifying a variant of equation (1) to estimate the marginal propensity to consume (MPC) from food

stamp transfers. In estimating the MPC, the panel data (986 households over 1989-1991) was exploited. Following Ravallion, van de Walle and Gautam, (1995) the first difference of consumption was regressed on the first difference of FSP and other household characteristics between 1991 and 1989. This was used to estimate an 'average' MPC for the sample.

Three regressions representing three definitions of household expenditure were estimated (see Table 7). With few exceptions (month of interview, dummy variables to capture the quality of housing), all other variables are first differences. The regressions also include variables for household structure (i.e. household composition and education of household head). Variables to capture quality of housing were included in the regression to capture household income effects. Aside from variables that captured housing quality and household structure, additional variables that influence program access were also included in the regressions — i.e. dummy for the presence of pregnant or lactating women, dummy variable for the presence of a person receiving food stamps because they ar disabled. However, a proxy variable that indicated whether there were handicapped individuals receiving Poor Relief transfers in a household was included in the regressions. This variable was found to be significant, but did not alter the estimate of the marginal propensity to consume out of food stamp transfers.

Table 7 summarizes the regression results. The results yield coefficients of .12 and .11 for the impact of food stamp transfers on expenditures—depending on whether expenditures exclude or include non-consumption expenditure on insurance, taxes, transfers, interest, and depreciation assets. There are several potential explanations for

the small magnitude of the MPC. It is possible that households are saving part of the transfers, however it is implausible that this alone explains the magnitude of the MPC. There might be some reduction in the MPC if households sold part of their reciepts of FSP. However, the more plausible explanation is that households are consuming more leisure. Alderman and Sahn found this to be the case for their study of the effect of food stamp transfers on labor supply in Sri Lanka.

The change in food stamp transfers between 1989 and 1991 significantly explains the change in total expenditures over the same period. However, this effect is not significant for food expenditures. This suggests that because food stamps are easily fungible with cash, the impact of food stamps is to be found mainly on non-food consumption.

Table 7: Consumption Effects of Food Stamps

Independent Variables	*Dependent Variables*					
	Expenditure (Excluding Non-Consumption) 1/		*Expenditure (Including Non-Consumption)* 1/		*Food Expenditure*	
	Parameter	*T-ratio*	*Parameter*	*T-ratio*	*Parameter*	*T-ratio*
Intercept	0.574	1.13	0.844	1.98	-0.101	-0.25
Food Stamp	0.115	2.39	0.108	2.67	0.042	1.09
Change in Household Structure	0.104	0.65	0.092	0.68	0.207	1.60
Secondary Education	-0.029	-0.75	-0.017	-0.51	0.082	2.63
Post-Secondary Educ.	0.042	0.56	0.031	0.49	0.004	0.07
No. of Children:						
less than 4 yrs.	0.006	0.33	0.008	0.51	0.02	1.27
4 - less than 9 yrs.	0.047	2.05	0.027	1.39	0.045	2.44
9- less than 14 yrs.	0.013	0.65	0.009	0.53	-0.001	-0.06
14- less than 19 yrs.	0.124	5.97	0.099	5.69	0.080	4.80
No. of Adults :						
19 - less than 25 yrs.	0.095	4.79	0.079	4.77	0.077	4.79
25 - less than 30 yrs	0.123	4.05	0.119	4.68	0.103	4.23
30 - less than 45 yrs.	0.096	3.39	0.091	3.83	0.072	3.16
45 - less than 55 yrs.	0.138	4.18	0.144	5.19	0.184	6.92
55 or older	0.005	0.18	0.025	0.97	0.072	2.86
Stone/brick/concr. Wall	0.202	0.86	0.054	0.27	-0.116	-0.61
Block Wall	-0.177	-0.81	-0.194	-1.05	-0.133	-0.75
Other (not wood) Wall	-0.415	-1.16	-0.766	-2.54	0.166	0.57
Metal Roof	-0.427	-1.49	-0.746	-3.11	0.181	0.79
Concrete floor	-0.353	-0.814	-0.067	-0.18	-0.035	-0.10
Wood floor	-0.361	-0.820	-0.081	-0.22	-0.154	-0.44
Tile/marble floor	0.275	0.618	0.475	1.27	0.207	0.58
Toilet with sewer	-0.472	-2.08	-0.182	-0.95	-0.067	-0.36
Toilet without sewer	-0.542	-2.95	-0.085	-0.55	0.003	0.24
Rural	0.393	7.25	0.385	8.47	0.364	8.35
Pregnant or Lactating	0.129	0.22	0.046	0.25	0.306	1.76
Female Headed HH	0.106	0.05	0.124	3.28	0.157	4.33
Handicapped	1.886	3.29	1.636	3.41	0.463	1.01
Month of interview in 89	0.249	1.75	0.192	1.61	0.240	2.09
Month of interview in 90	-0.095	-0.43	-0.042	-0.22	0.306	1.70
Month of interview in 91	-0.349	-1.82	-0.186	-1.15	-0.214	-1.38
Adjusted R-Square		0.31		0.35		0.37
F-Statistic		15.9		19.0		20.2
Number of Observations		967				967

1/ Non-consumption expenditure refers to expenditure on taxes, insurance, transfers, depreciation of assets. The change in household structure attempts to capture whether there has been a significant change in household structure (lifecycle). It is a dummy variable equal to 1 if the change in the age of the household head between 1989 and 1991 exceeds 2. All variables, except the month of interview, and the dummy for wood material for walls in 1989 (Wall 1989) are first differences.

7 The Impact of the FSP on Household Poverty

In order to examine the impact of the FSP on poverty, the data samples (for the years 1989 to 1991) were divided into household groups according to the age of children present in the household. This categorization was chosen because the eligibility criteria of the FSP is based on household composition that is closely tied to the presence of young children within the household. Households were also differentiated according to whether they moved into and out of poverty (transient poor) or whether they remained in poverty (structural poor) throughout the period 1989-1991. This categorization of structural versus transient poverty was used to examine the effect of the FSP on the dynamic aspects of poverty. The following three questions were examined regarding the impact of the FSP on the poverty headcount and gap:

i) How effective was the FSP in reducing poverty within each year (1989-1991)?

ii) Was the FSP more effective in some years relative to others?

iii) Was the FSP more effective in reducing poverty measures for certain vulnerable groups compared to others?

How Effective were Food Stamps in Reducing Poverty, 1989-1991? The results of first and second order dominance tests are summarized in Table 9. First order dominance tests show that in 1989 pre-FSP and post-FSP expenditure cannot be ranked for any type of household. In 1990 however, post-FSP dominates pre-FSP for all households except those households with children aged 0 to 5, and households that have elderly members.

In these households, post- and pre-FSP cannot be ranked. Similarly, in 1991, post-FSP dominates pre-FSP expenditure for all households, except those households that have no children under 14 years of age. Thus, FSP was less effective in reducing poverty headcount for households with preschoolers or the elderly in 1990, and households that had no children in 1991.

Table 9: Dominance Tests of Expenditure (with and without FSP) by Household Structure [1/]

Household Category	*Dominance Tests*		
First Order Dominance			
Households with:	*1989*	*1990*	*1991*
No children between 0-14 years	X	D	X
Children 0-5 years	X	X	D
Children 5-10 years	X	D	D
Children 10-14 years	X	D	D
The Elderly	X	X	D
All Households	X	D	D
Second Order Dominance			
Households with:			
No children between 0-14 years	X	D	D
Children 0-5 years	D	D	D
Children 5-10 years	D	D	D
Children 10-14 years	X	D	D
The Elderly	D	D	D
All Households	X	D	D

[1/] X denotes that pre- and post-FSP expenditure cannot be ranked. D denotes that post-FSP dominates pre-FSP transfer. The elderly include men over 65 and women over 60.

In the case of second order dominance, post-FSP expenditure dominates pre-FSP expenditure in 1989 for households with children between the ages of 0 and 10 years, and also for households with the elderly. For all other household types in 1989 pre- and post-FSP expenditure cannot be ranked. Post-FSP expenditure dominates pre-FSP expenditure for *all* households during the years 1990 and 1991. Thus, FSP was most effective in reducing the poverty gap during the years 1990 and 1991 for all households. In 1989, it was effective only for households with young children. In summary, the poverty gap in Jamaica would have been significantly higher without the FSP, though it would have made little difference to the incidence of poverty. In order to assess the sensitivity of these results, marginal dominance tests were conducted on food stamp transfers both with and without behavioral assumptions. The results are summarized in Table 10.

As Table 10 shows, in 1989, there is no large difference in expenditure on food stamp levels across the various behavioral assumptions regarding food stamp income. In 1990, when food stamp transfers were at their lowest, there is also no significant difference across the various behavioral assumptions. However, in 1991, food stamp transfers are at their highest levels. (This is after the restructuring of the system and discussed further in the next section).

Incorporating behavioral responses leads to an increase in 1991 consumption, for the poorest groups of 1 percent, at the margin. By contrast, when behavioral responses are ignored, expenditures at the margin are 9 percent higher than would be the case without FSP. These results are consistent with other studies which have found that incorporating

behavioral responses into incidence analysis significantly alters the poverty impact of the program.

For example, Van de Walle, Ravallion and Gautam also find that incorporating behavioral responses leads to lower poverty impact of cash transfers in Hungary (compared to an assumption of no behavioral response in consumption). Similarly, Sahn and Alderman found that for Sri Lanka, explicitly incorporating labor supply into their analysis of the poverty impact of the FSP, led to a large and significant reduction in work effort.

Table 10: Percent Change in Household Consumption due to Food Stamp Transfers

	Without Behavioral Response		**With Behavioral Response**	
Year	**Poorest**	**Poor Close to Poverty Line**	**Poorest**	**Poor Close to Poverty Line**
1989	6.0	1.5	2.5	0.8
1990	2.2	0.6	1.0	0.3
1991	9.2	2.0	3.0	1.0

Note: Poorest groups refers to those earning less than half of income at the poverty line. Poor close to the poverty line refer to groups earning income within the range of 25% above or below the poverty line.
Source: Table 11.

Table 11: First Order Marginal Dominance of Food Stamp Transfers for the Poor by Various Behavioral Assumptions, 1989-1991

Alternative Poverty Lines	*1989*			*1990*			*1991*			*1989-90*	*1989-91*	*1990-91*
(as multiples of the poverty lineJ$6198)	*Before-FS Expenditure*	*After-FS Expenditure*	*Food Stamps*	*Before-FS Expenditure*	*After-FS Expenditure*	*Food Stamps*	*Before-FS Expenditure*	*After-FS Expenditure*	*Food Stamps*	*T-tests for food stamp means*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
Food Stamps Assumed Exogenous												
0.50	2345	2362	102	2345	2351	35	2362	2382	126	3.66	-1.11	-4.51
0.75	3896	3913	104	3883	3889	36	3904	3926	137	4.33	-1.39	-4.97
1.00	5430	5446	92	5442	5446	25	5350	5368	105	4.18	-0.58	-4.49
1.25	6978	6989	70	6950	6956	33	6964	6981	103	2.50	-1.15	-1.98
1.50	8480	8488	53	8473	8477	23	8462	8477	92	2.25	-1.40	-1.95
No Behavioral Assumptions	Before-FS Expenditure	After-FS Expenditure	Food Stamps	Before-FS Expenditure	After-FS Expenditure	Food Stamps	Before-FS Expenditure	After-FS Expenditure	Food Stamps	T-tests for food stamp means		
0.50	2284	2421	137	2344	2396	52	2299	2511	212	3.70	-1.89	-3.31
0.75	3876	3971	102	3885	3914	29	3894	4062	168	4.92	-2.09	-4.06
1.00	5417	5505	88	5441	5474	33	5342	5433	90	3.98	-0.09	-2.85
1.25	6971	7033	62	6955	6989	34	6953	7031	79	2.09	-0.98	-2.25
1.50	8480	8543	63	8470	8477	8	8461	8497	35	3.49	1.62	-2.47

Variable impacts on different vulnerable groups. The discussion in the previous sections outlined the overall pattern of poverty in Jamaica during 1989-91 with and without the FSP. This section will address how effective food stamps transfers were in reducing poverty for various household types during this period. Figures 3 to 6 summarize the results of first and second order marginal dominance tests (FOMD, SOMD) for the impact of food stamps for households below, at, and above the poverty line of J$6198 (set at 1 in the Figures) in 1991 dollars. The results indicate that the impact of food stamps on poverty is sensitive to the poverty line chosen.

First, the per capita mean and cumulative mean food stamp transfers were significantly lower in 1990 than in 1989 and 1991 (see also Table 12). It is not clear why there is such a large difference in per capita FSP transfers to households between 1990 and 1989, 1991. One explanation may be that the level of need declined in 1990 and increased thereafter. However, poverty estimates summarized in Table 1, along with stochastic dominance tests of expenditure over these years, do not support this explanation. A more plausible explanation is that the major reorganization of the FSP in 1990 reduced the access of households to benefits. This reorganization reduced the administrative ceiling of 400,000 beneficiaries to 300,000 : 150,000 children under five, 15,000 pregnant women, 15,000 lactating mothers, accounting for 60 percent of the lower total; and 120,000 or 40 percent were those in income related categories. A new beneficiary category was also introduced to cover individuals in households of two or more persons earning total income of $7,200 annually and single member households earning $3,000.

Figures 5 and 6 show that below the poverty line of J$6198 (represented by the number 1 along the horizontal axis), households with young children faired better in 1991 with respect to the impact of the FSP on headcount and poverty gap measures of poverty. Relatively speaking, the reorganization seems to have benefited those households with young children more than those households without young children.

In terms of the dynamic aspects of poverty, Figures 3 and 4 show that those exposed to prolonged periods of poverty faired better with the FSP in 1991 than in the previous two years. For the transient poor, the FSP was most effective in reducing the poverty headcount in 1989. The data in these years suggest that the reorganization of the FSP benefited those suffering from prolonged periods of poverty relatively more compared to the transient poor.

Which Vulnerable Groups Benefited most from the FSP? In order to determine for which groups the FSP was most effective in reducing their poverty, FOMD, and SOMD tests of per capita FSP transfers were performed. Figures 3 to 6 present graphical representations of these curves. Figures 3 and 4 compare the effects of the FSP on poverty measures for the structural and transient poor, from 1989 to 1991. As Figure 3 shows, before the reorganization, FSP transfers were more effective in reducing the headcount measure for the transient poor. However, after the reorganization FSP transfers were more effective in reducing poverty measures for the structural poor. In terms of SOMD, or the poverty gap, before the reorganization FSP was most effective in reducing the poverty gap for the transient poor. During the 1990 reorganization, the structural poor benefited more from reductions in the poverty gap due to FSP transfers. However, a year after the

reorganization, it is not clear which group benefited most from FSP transfers — the structural or the transient poor.

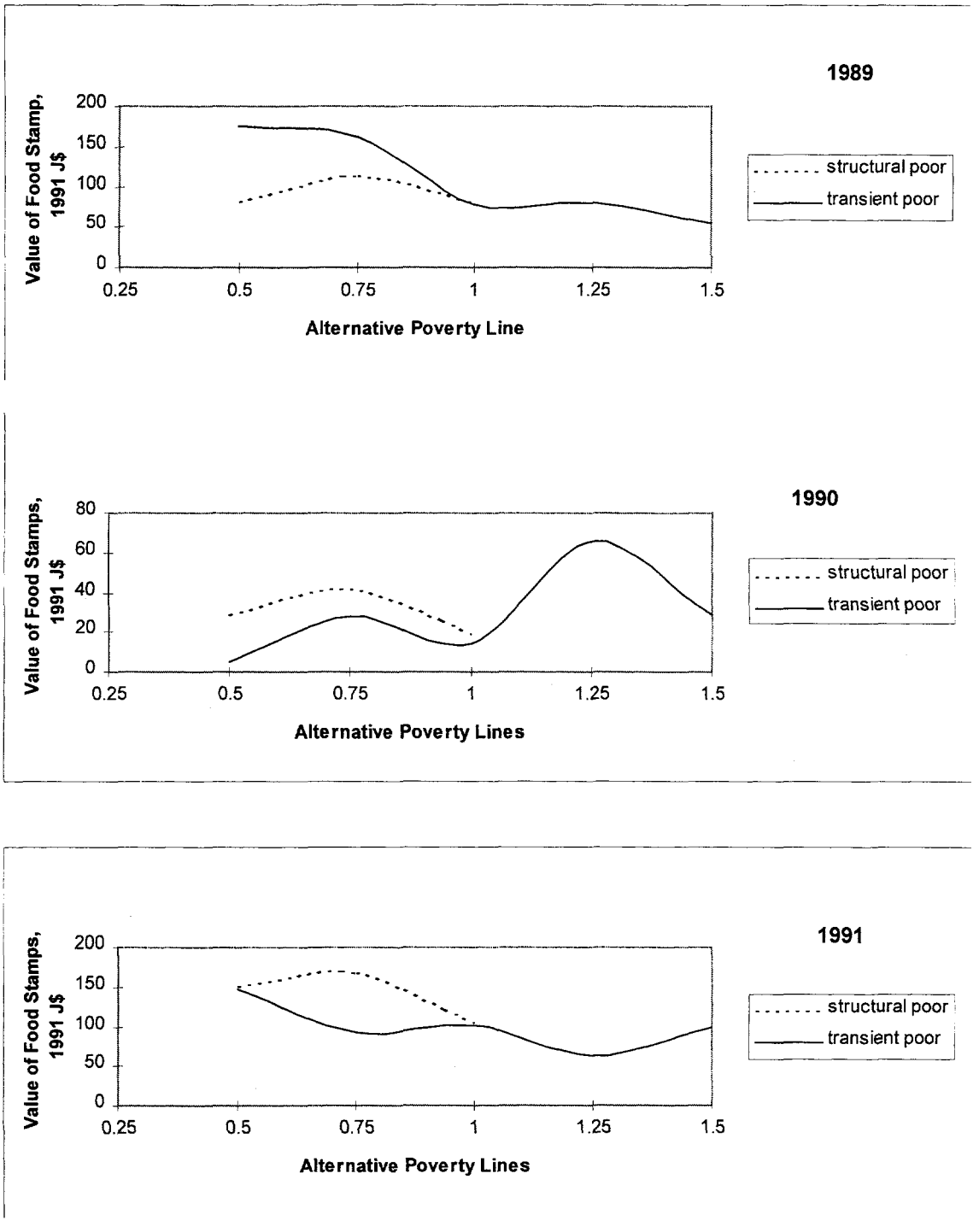
Figures 5 and 6 compare the relative impact of the FSP for households differentiated according to the presence of young children in the household. The figures show that those households with no young children benefited most from the FSP transfers in terms of reduction in the headcount measure of poverty.

8 Conclusions

This paper has examined the impact of the food stamp program on measures of poverty during the devaluation of the Jamaican dollar in the early 1990s. The broad finding of the paper is that in the absence of FSP, the poverty gap in Jamaica would have been much higher. This is particularly the case for the years 1990 and 1991. For the country as a whole, the absence of the FSP would not have affected the incidence of poverty significantly. However, without the FSP, particular groups among the poor would have faired worse. In particular, households with the elderly benefited most. Households with young children benefited relatively more (compared to households without young children), in terms of the contribution of the FSP to a reduction in the poverty headcount and gap for these groups. Also, the program appears to have had a greater impact on the poverty headcount and gap of extremely poor households compared to those households that moved into and out of poverty (the transient poor). Moreover, explicitly incorporating behavioral responses reduces the contribution of FSP to household consumption/poverty, but the poorest have benefited the most from the program even

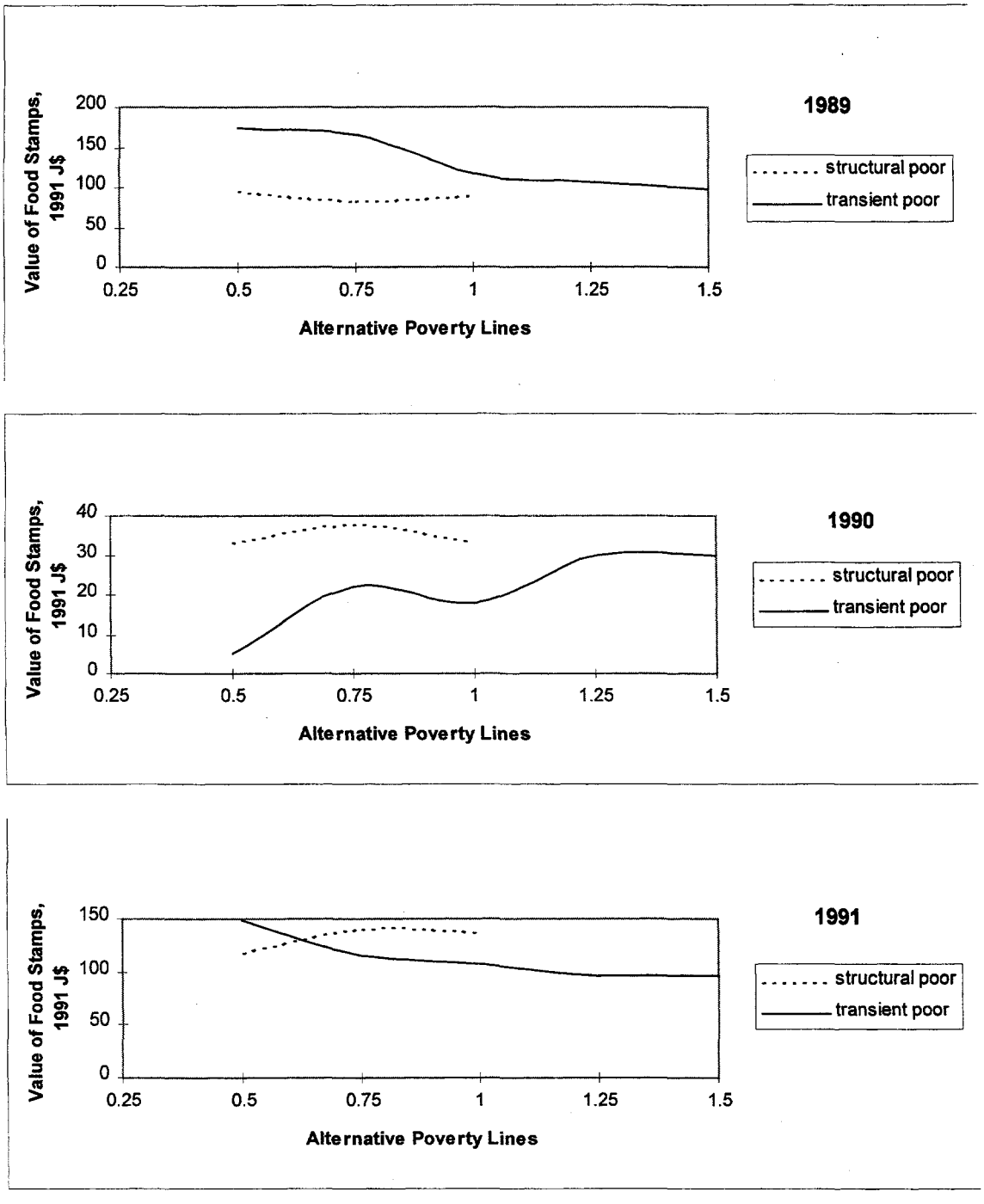
after accounting for behavioral responses. Nevertheless, the program contributed more toward a reduction in poverty than in smoothing consumption.

Figure 3: Comparison of Structural and Transient Poor, FOMD



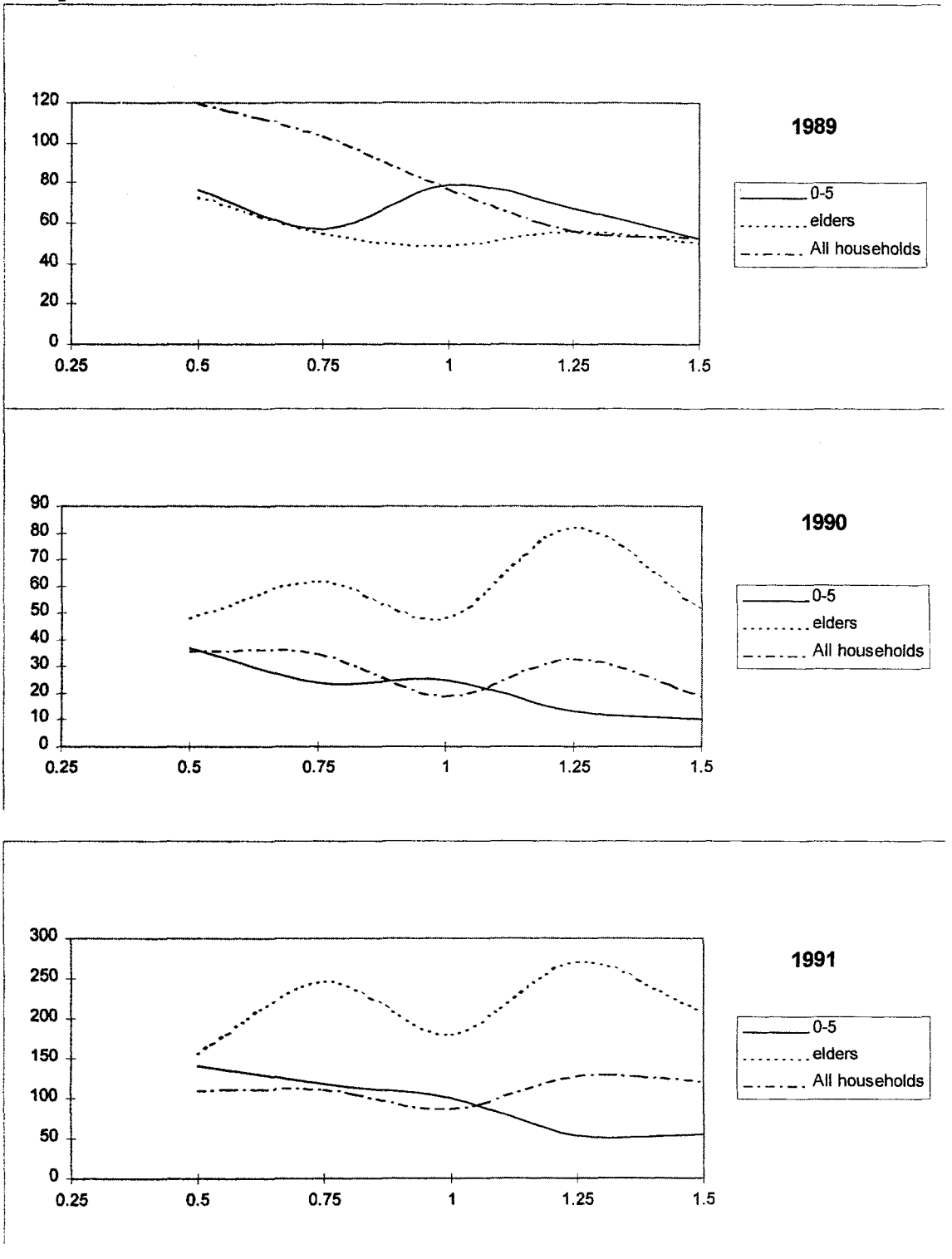
Note: Alternative poverty lines represent fractions of J$6198 (in 1991 dollars, which is the third decile of 1989 percapita expenditure).

Figure 4: Comparison of Structural and Transient Poor, SOMD



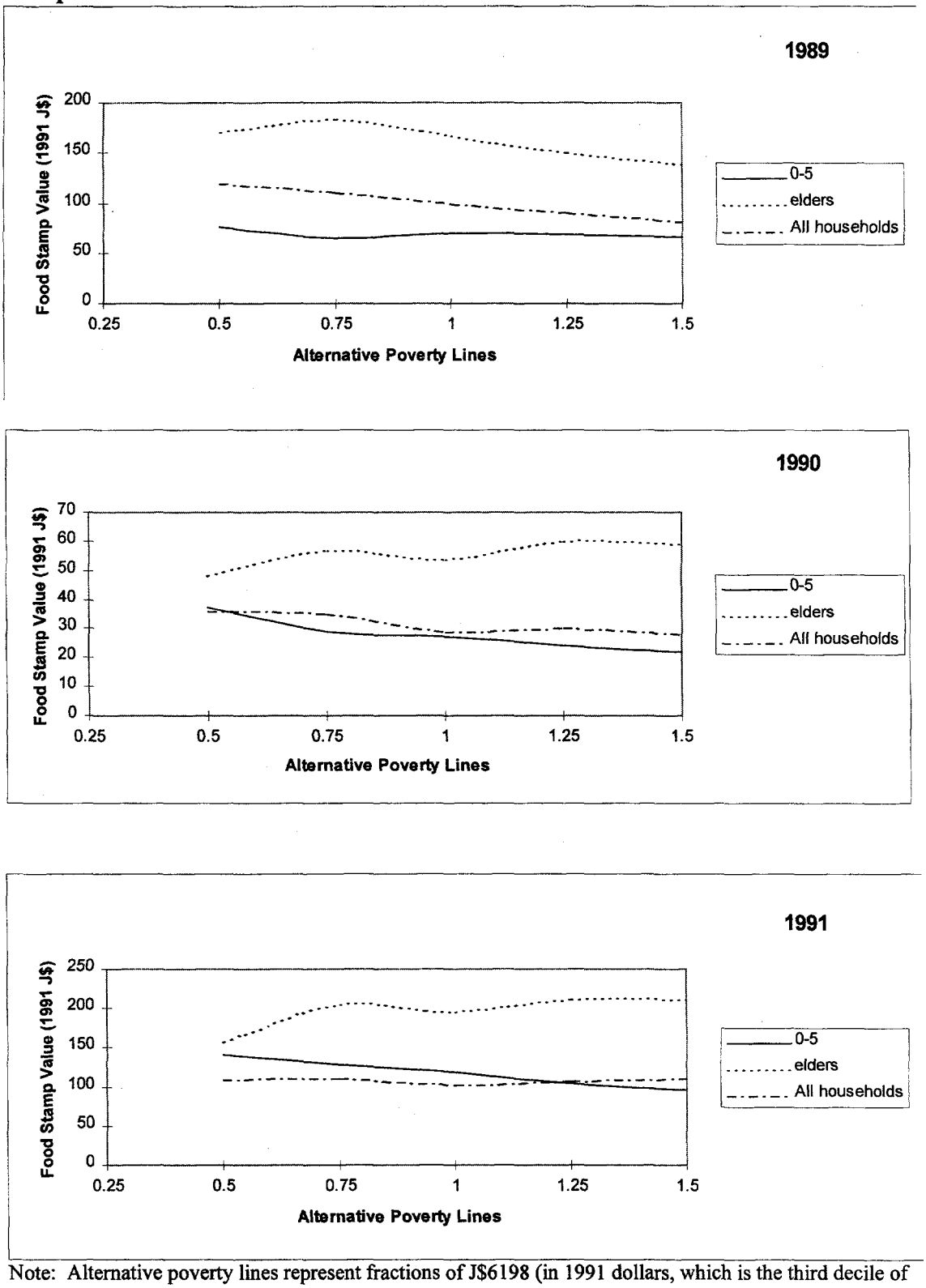
Note: Alternative poverty lines represent fractions of J$6198 (in 1991 dollars, which is the third decile of 1989 percapita expenditure).

Figure 5: First Order Marginal Dominance Comparison by Household Composition



Note: Alternative poverty lines represent fractions of J$6198 (in 1991 dollars, which is the third decile of 1989 percapita expenditure).

Figure 6: Second Order Marginal Dominance Comparison by Household Composition



Note: Alternative poverty lines represent fractions of J$6198 (in 1991 dollars, which is the third decile of 1989 percapita expenditure).

References

Andersen, Patricia. 1993. The Incorporation of Mothers and Children into the Jamaican Food Stamp Programme. Jamaican Poverty Line Project, Planning Institute of Jamaica. Working Paper No.6. February.

Bishop, J., J. P. Formby, and L. Zeager. 1996. "The Impact of Food Stamps on US Poverty in the 1980s: A Marginal Dominance Analysis." Economica 63, pp.S141-S162.

Forster, J.E., Greer, J. and Thorbecke, E. 1984. A Class of Decomposable Poverty Measures. Econometrica, 52, 761-6.

Foster, J. E., and Shorrocks, A. F. 1988. Poverty Orderings. Econometrica, 56, 173-7.

Gordon, Derek. 1989. Identifying the Poor: Developing a Poverty Line for Jamaica." Jamaican Poverty Line Project Working Paper No. 3, Planning Institute of Jamaica. Kingston, Jamaica.

Grosh, Margaret. 1992. "The Jamaican Food Stamps Programme: A Case Study in Targeting". Food Policy, Vol. 17, No.1. February, pp.23-40.

Grosh, Margaret. 1991. "The Household Survey as a tool for Policy Change: Lessons from the Jamaican Survey of Living Conditions." Living Standards Measurement Study Working Paper No. 80, The World Bank. Washington.

Louat, F. M Grosh, J. van der Gaag. 1993. "Welfare Implications of Female Headship in Jamaican Households." Living Standards Measurement Study Working Paper No. 96. World Bank.

Ravallion, M., D. Van de Walle, and M. Gautam. 1994. "Testing a Social Safety." Journal of Public Economics vol 57, pp.175-199.

Ravallion, M. 1992. Poverty Comparisons. World Bank.

Sahn, D., and H. Alderman. 1995. "Incentive Effects on Labor Supply of Sri Lanka's Rice Subsidy." In D. Van de Walle and K. Nead (eds.), Public Expenditures and the Poor: Theory and Evidence. The World Bank.

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS2187	Who Determines Mexican Trade Policy?	Jean-Marie Grether Jaime de Melo	September 1999	L. Tabada 36896
WPS2188	Financial Liberalization and the Capital Account: Thailand, 1988–97	Pedro Alba Leonardo Hernandez Daniela Klingebiel	September 1999	R. Vo 33722
WPS2189	Alternative Frameworks for Providing Financial Services	Stijn Claessens Daniela Klingebiel	September 1999	R. Vo 33722
WPS2190	The Credit Channel at Work: Lessons from the Republic of Korea's Financial Crisis	Giovanni Ferri Tae Soo Kang	September 1999	K. Labrie 31001
WPS2191	Can No Antitrust Policy Be Better Than Some Antitrust Policy?	Aaditya Mattoo	September 1999	L. Tabada 36896
WPS2192	Districts, Spillovers, and Government Overspending	Reza Baqir	September 1999	S. Devadas 87891
WPS2193	Children's Growth and Poverty in Rural Guatemala	Michele Gragnolati	September 1999	M. Gragnolati 85287
WPS2194	Does Democracy Facilitate the Economic Transition? An Empirical Study of Central and Eastern Europe And the Former Soviet Union	Jean-Jacques Dethier Hafez Ghanem Edda Zoli	October 1999	H. Ghanem 85557
WPS2195	Aggregating Governance Indicators	Daniel Kaufmann Aart Kraay Pablo Zoido-Lobatón	October 1999	D. Bouvet 35818
WPS2196	Governance Matters	Daniel Kaufmann Aart Kraay Pablo Zoido-Lobatón	October 1999	D. Bouvet 35818
WPS2197	Production Sharing in East Asia: Who Does What for Whom, and Why?	Francis Ng Alexander Yeats	October 1999	L. Tabada 36896
WPS2198	How the Chinese System of Charges and Subsidies Affects Pollution Control Efforts by China's Top Industrial Polluters	Hua Wang Ming Chen	October 1999	H. Wang 33255
WPS2199	Managing Risks of Capital Mobility	Mansoor Dailami	October 1999	W. Nedrow 31585
WPS2200	The Role of Trust in Financial Sector Development	Biagio Bossone	October 1999	E. Mekhova 85984

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS2201	Financial Development and Industrial Capital Accumulation	Biagio Bossone	October 1999	E. Mekhova 85984
WPS2202	Specialization without Regret: Transfer Rights, Agricultural Productivity, and Investment in an Industrializing Economy	Michael R. Carter Yang Yao	October 1999	M. Fernandez 33766
WPS2203	Market versus Administrative Reallocation of Agricultural Land in a Period of Rapid Industrialization	Michael R. Carter Yang Yao	October 1999	M. Fernandez 33766
WPS2204	Corruption under Moral Hazard	Gunnar S. Eskeland Henrik Thiele	October 1999	H. Sladovich 37698
WPS2205	Foreign-Owned Capital and Endogenous Tariffs	Marcelo Olarreaga	October 1999	L. Tabada 36896
WPS2206	Household Childcare Choices and Women's Work Behavior in Russia	Michael M. Lokshin	October 1999	P. Sader 33902